# HOXB13 gene

homeobox B13

## Normal Function

The *HOXB13* gene provides instructions for producing a protein that attaches (binds) to specific regions of DNA and regulates the activity of other genes. On the basis of this role, the protein produced from the *HOXB13* gene is called a transcription factor. The HOXB13 protein is part of a large group of transcription factors called the homeobox protein family. The HOXB13 protein is thought to play a role in the development and maintenance of the skin. It also acts as a tumor suppressor, which means that it keeps cells from growing and dividing too fast or in an uncontrolled way.

The HOXB13 protein has a characteristic homeobox region called the homeodomain, which binds to DNA, and two other regions called MEIS interacting domains. The MEIS interacting domains are thought to help regulate the activity of the HOXB13 protein by controlling the binding of the homeodomain with DNA.

## Health Conditions Related to Genetic Changes

prostate cancer

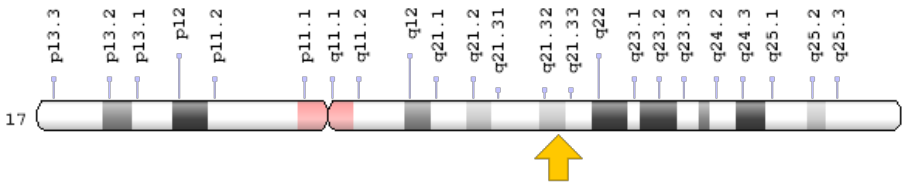
At least two mutations in the *HOXB13* gene have been associated with an increased risk of prostate cancer; the disease may also be more aggressive in affected men with a *HOXB13* mutation. These mutations are present in every cell of the body and can be passed from one generation to the next. As a result, they are associated with cancers that cluster in families. However, not everyone who inherits a mutation in the *HOXB13* gene will ultimately develop prostate cancer. Other genetic, environmental, and lifestyle factors also contribute to a person's cancer risk.

The *HOXB13* gene mutations that are associated with prostate cancer alter the MEIS interacting domains of the HOXB13 protein. Researchers suggest that the changes may impair the ability of these domains to regulate the HOXB13 protein's interactions with DNA. As a result, the protein's tumor suppressor function is impaired, resulting in the uncontrolled cell proliferation that can lead to prostate cancer.

## Chromosomal Location

Cytogenetic Location: 17q21.32, which is the long (q) arm of chromosome 17 at position 21.32

Molecular Location: base pairs 48,724,763 to 48,728,749 on chromosome 17 (Homo sapiens Annotation Release 108, GRCh38.p7) (NCBI)




Credit: Genome Decoration Page/NCBI

## Other Names for This Gene

- homeobox protein Hox-B13
- HXB13_HUMAN
- PSGD

## Additional Information & Resources

Educational Resources

- Molecular Biology of the Cell (fourth edition, 2002): Homeodomain Proteins Constitute a Special Class of Helix-Turn-Helix Proteins https://www.ncbi.nlm.nih.gov/books/NBK26806/#A1240

Scientific Articles on PubMed

- PubMed https://www.ncbi.nlm.nih.gov/pubmed?term=%28%28HOXB13%5BTIAB%5D%29+OR+%28homeobox+B13%5BTIAB%5D%29%29+AND+%28%28Genes%5BMH%5D%29+OR+%28Genetic+Phenomena%5BMH%5D%29%29+AND+english%5Bla%5D+AND+human%5Bmh%5D+AND+%22last+1800+days%22%5Bdp%5D

OMIM

- HOMEOBOX B13 http://omim.org/entry/604607

Research Resources

- Atlas of Genetics and Cytogenetics in Oncology and Haematology
  http://atlasgeneticsoncology.org/Genes/GC_HOXB13.html
- HGNC Gene Family: HOXL subclass homeoboxes
  http://www.genenames.org/cgi-bin/genefamilies/set/518
- HGNC Gene Symbol Report
  http://www.genenames.org/cgi-bin/gene_symbol_report?q=data/hgnc_data.php&hgnc_id=5112
- NCBI Gene
  https://www.ncbi.nlm.nih.gov/gene/10481
- UniProt
  http://www.uniprot.org/uniprot/Q92826

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